

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Alcohol control policies and socioeconomic inequalities in hazardous alcohol consumption: a 22-year cross-sectional study in a Swiss urban population
AUTHORS	Sandoval, José Luis; Leão, Teresa; Theler, Jean-Marc; Favrod-Coune, Thierry; Broers, Barbara; Gaspoz, Jean-Michel; Marques-Vidal, Pedro; Guessous, Idris

VERSION 1 - REVIEW

REVIEWER	Carol C. Guarnizo-Herreno Universidad Nacional de Colombia, Colombia University College London, UK
REVIEW RETURNED	01-Feb-2019

GENERAL COMMENTS	<p>This interesting analysis examined socioeconomic inequalities in alcohol consumption over a 22-year period among adults in Geneva (Switzerland). The research problem is well presented in the context of current literature and the theoretical basis of the study is also clearly stated. This is a well-written manuscript, with sounding methodology and very good statistical analysis. Before publication, however, there are some minor issues that I would recommend be explored by the authors:</p> <ol style="list-style-type: none">1. Abstract: Just for the sake of clarity, I think the text in the Design subsection should be: 'Repeated cross-sectional surveys'.2. Abstract: the 'Outcome measures' subsection presents a description of variables (including explanatory variables) and measures of inequality employed in the analysis. Could this section be called Methods instead? -to better reflect its content.3. Abstract -Results subsection: This might be a personal preference, but I would recommend reporting RII and SII estimates together with their 95% confidence intervals, instead of p-values, as the former are more informative and sufficient.4. Abstract -Results subsection: Since the findings presented in this subsection are focused on hazardous consumption, it should be clear to the reader that for women, although significant inverse gradients were found by educational attainment, no significant inequalities were identified by occupational level (in the pooled data).5. Introduction: On page 5, lines 3-10, the authors indicate that some studies have been conducted on the equity impact of taxation policies. I think a very brief mention of the findings of those studies would be interesting and informative.
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6. Introduction: When describing the aim of the study, only hazardous alcohol consumption is mentioned. Since all analyses were also conducted for the outcome of daily alcohol consumption (g/day), it would be appropriate to also include it.

7. Methods: Response rates of the Bus Santé study for periods 1996-2003 and 2010-2014 are indicated, but not for the 2004-2009 period -which is period 3 in this analysis. Could the authors please include this information?

8. I would suggest adding: 'For descriptive statistics...' at the beginning of the first sentence under the Statistical analysis subheading (page 8, lines 28-31).

9. This is a very minor point, but please clarify that the RIIGEN command in Stata actually generates the SES variable (score) and that is then used to calculate SII and RII.

10. Results: When describing the analytical sample, please include the sample size for each of period analysed.

11. Authors state that higher educated participants of both genders were more often Swiss. However, according to Table 1, larger proportions of adults with Swiss nationality were found among those in the secondary, rather than tertiary educational level. Please revise and amend if necessary.

12. Table 2 and Supplementary Table 3 present unadjusted and adjusted estimates of PRs, RII and SII. However, unless differences between those estimates are going to be discussed in the manuscript, I would advise reporting only adjusted estimates.

13. It would be important to clarify why no RII estimates were calculated for the outcome of daily alcohol consumption. There are various examples of studies which have derived RII with numerical variables as outcomes.

14. Please include the word 'relative' in the following sentence: "In men, we identified absolute and education-related inequalities in hazardous alcohol consumption..."

15. After the description of educational inequalities over time (page 12, lines 25-48), authors state: "Similar results were obtained concerning daily alcohol intake". However, while no significant educational inequalities were identified in women for hazardous consumption during the legislative periods, significant inverse gradients were found in periods 1 and 3 for daily consumption (according to Supplementary Figure 3). This might be something worth mention it.

16. When examining changes over time in the magnitude of inequalities as measured by RII and SII, one very good option is to test for significance of an interaction term between the SEP variable and survey year. The authors might want to conduct a sensitivity analysis with this approach to further discuss the (non-)significance of changes in inequalities in alcohol consumption over the study period.

	<p>17. Discussion: In the first paragraph of this section, which summarizes findings, I think it would be necessary to clarify that in women, there was a picture of no significant inequalities combined with inverse gradients -and then mention specifically what those were.</p> <p>18. One point that needs more discussion, I believe, has to do with the limitations of this kind of analysis to really assess or evaluate the impact of policy measures.</p> <p>19. An interesting finding that could be further discussed by the authors is the difference observed between men and women: what could be the potential explanations and policy implications of the different patterns observed?</p> <p>20. Please clarify that the inequalities in alcohol consumption mentioned in the conclusion statement refer to men, and a very different picture was found among women.</p>
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REVIEWER	Tania Alfaro Public Health School, Faculty of Medicine, University of Chile, Chile
REVIEW RETURNED	01-Feb-2019

GENERAL COMMENTS	<p>Two comments in the attached file.</p> <p>I suggest to include in the discussion as a limitation the fact that the law implemented in the different periods could have different target groups (maybe, a cohort effect could be considered too) and not necessarily equity targets (except taxes that have been specified in the introduction), because the authors are assuming that the law should impacted according the SES. At the same time, the different law implemented in each period could have an effect into the next period, in terms of consumption, for example (even though the limitation of the cross-sectional study is discussed by the authors -and it assumes that is not the same people interviewed, changing eventually the group of abstainers-). Another factors do not explored could be health status and mental health.</p> <p>The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.</p>
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VERSION 1 – AUTHOR RESPONSE

Responses to reviewers' comments

Reviewer: 1

1) Abstract: Just for the sake of clarity, I think the text in the Design subsection should be: 'Repeated cross-sectional surveys'.

This has now been added.

"Repeated cross-sectional survey study" (Page 2, Line 24)

2) Abstract: the 'Outcome measures' subsection presents a description of variables (including explanatory variables) and measures of inequality employed in the analysis. Could this section be called Methods instead? -to better reflect its content.

We have followed the submission guidelines of BMJ Open. We checked their website and some articles have a "methods" section in the abstract. If this poses no problem to the editor, we have changed it according to your suggestion.

3) Abstract -Results subsection: This might be a personal preference, but I would recommend reporting RII and SII estimates together with their 95% confidence intervals, instead of p-values, as the former are more informative and sufficient.

This has now been corrected to:

"Lower educated men had a higher frequency of hazardous alcohol consumption (RII=1.87 [1.57;2.22] and SII=0.14 [0.11;0.17]). Lower educated women had less hazardous consumption ((RII=0.76 [0.60;0.97] and SII=-0.04 [-0.07;-0.01])." (Page 2, Line 52)

4) Abstract -Results subsection: Since the findings presented in this subsection are focused on hazardous consumption, it should be clear to the reader that for women, although significant inverse gradients were found by educational attainment, no significant inequalities were identified by occupational level (in the pooled data).

Thank you for your comments. We had not included this information due to the abstract word limit. We have now added a sentence with this information and we agree it should be included in the abstract, if the editor does not disagree.

"In women, significant inverse SES gradients were observed using educational attainment but not for occupational level." (Page 3, Line 7)

5) Introduction: On page 5, lines 3-10, the authors indicate that some studies have been conducted on the equity impact of taxation policies. I think a very brief mention of the findings of those studies would be interesting and informative.

Thank you. A brief mention of the results of these studies has now been included.

"Existing studies mainly focus on the equity impact of taxation policies with results suggesting that tax increases have a strong pro-equity effect, particularly for those with higher alcohol consumption.[13-14]" (Page 4, Line 60)

6) Introduction: When describing the aim of the study, only hazardous alcohol consumption is mentioned. Since all analyses were also conducted for the outcome of daily alcohol consumption (g/day), it would be appropriate to also include it.

Thank you. We have now added the analyses on total daily alcohol consumption as a secondary aim of the study.

"The main aim of this study was, first, to determine if an SES gradient in hazardous alcohol consumption exists in the adult population of Geneva and, second, to assess the impact of the implemented alcohol control policies on this gradient, if any. As a secondary aim, we also sought to determine the impact of the successive legislative interventions on inequalities of total daily alcohol consumption, if they existed." (Page 5, Line 33)

7) Methods: Response rates of the Bus Santé study for periods 1996-2003 and 2010-2014 are indicated, but not for the 2004-2009 period -which is period 3 in this analysis. Could the authors please include this information?

This information is now included.

“Participation rate varied with 60.1% for 1996-2003, 56.2% for 2004-2009 and 50.8% for the 2010-2014 period.” (Page 6, Line 40)

8) I would suggest adding: ‘For descriptive statistics...’ at the beginning of the first sentence under the Statistical analysis subheading (page 8, lines 28-31).

This has now been added.

“For descriptive statistics, continuous variables are presented...” (Page 8, Line 38)

9) This is a very minor point, but please clarify that the RIIGEN command in Stata actually generates the SES variable (score) and that is then used to calculate SII and RII.

This information is now in the methods text:

“We used the STATA package RIIGEN [26-27] to calculate SES variables adjusted for group size and relative SES position using a ridit scoring method. These variables were then used to calculate the slope index of inequality (SII) and the relative index of inequality (RII) which quantify absolute and relative differences between SES-defined strata, respectively.” (Page 9, Line 19)

10) Results: When describing the analytical sample, please include the sample size for each of period analysed.

This information was available in Table 1 but we have now included it in the text.

“Forty-three per cent of participants were surveyed in period 1, 21.2% in period 2, 14.8% in period 3 and 21.1% in period 4.” (Page 10, Line 41)

11) Authors state that higher educated participants of both genders were more often Swiss. However, according to Table 1, larger proportions of adults with Swiss nationality were found among those in the secondary, rather than tertiary educational level. Please revise and amend if necessary.

Thank you for pointing this out. We were considering those with secondary or tertiary education when compared to those with tertiary education. We have now removed the reference to Swiss nationality from this section of the text.

12) Table 2 and Supplementary Table 3 present unadjusted and adjusted estimates of PRs, RII and SII. However, unless differences between those estimates are going to be discussed in the manuscript, I would advise reporting only adjusted estimates.

As suggested, we have modified the two tables.

13) It would be important to clarify why no RII estimates were calculated for the outcome of daily alcohol consumption. There are various examples of studies which have derived RII with numerical variables as outcomes.

We preferred to use only the SII for the continuous outcome in order to have a measure that was more easily interpretable in this context. Since this was not our main outcome variable, we decided not to increase the complexity of the analysis. This information is now added to the text.

“For total daily alcohol consumption, a continuous outcome variable, we chose to only calculate the SII since it is more interpretable than a relative measure in this context and this was not the main outcome variable of the study.” (Page 9, Line 29)

14) Please include the word ‘relative’ in the following sentence: “In men, we identified absolute and education-related inequalities in hazardous alcohol consumption...”

Thank you. This has now been corrected.

“In men, we identified absolute and relative education-related inequalities in hazardous alcohol consumption...” (Page 13, Line 5)

15) After the description of educational inequalities over time (page 12, lines 25-

48), authors state: “Similar results were obtained concerning daily alcohol intake”. However, while no significant educational inequalities were identified in women for hazardous consumption during the legislative periods, significant inverse gradients were found in periods 1 and 3 for daily consumption (according to Supplementary Figure 3). This might be something worth mention it.

Thank you. This is now mentioned.

“However, contrarily to hazardous alcohol consumption for which no inequalities in women were observed in any of the periods, significant inequalities favouring the lower SES groups were observed in periods 1 and 3 (Supplementary Figure 3).” (Page 12, Line 17)

16) When examining changes over time in the magnitude of inequalities as measured by RII and SII, one very good option is to test for significance of an interaction term between the SEP variable and survey year. The authors might want to conduct a sensitivity analysis with this approach to further discuss the (non-)significance of changes in inequalities in alcohol consumption over the study period.

Thank you for the suggestion. We have performed the interaction analysis, which is reported in a Supplementary Table 4. We observed the same results, except for an increase in relative inequalities in hazardous consumption in men when comparing Period 1 to Period 4 using both SES indicators.

We have now clarified that there were no differences between successive periods, but possibly an overall increase in relative-inequalities in hazardous consumption particularly in the latest period.

Changes were made in the methods, results and discussion as follows:

Methods: “ A sensitivity analysis for interperiod differences in SES inequalities indexes was also performed through testing for significant interactions between the RIIGEN-generated SES variables and legislative period (Supplementary Table 4).” (Page 10, Line 15)

Results: “No differences between successive periods were observed ($p > 0.05$) (Figure 2a).” (Page 13, Line 10)

“Time trend interaction-based sensitivity analysis for education-related inequalities identified a difference in relative inequalities in period 4 (compared to the reference period 1), which seemed to increase (interaction=2.2 [1.3;3.6], $p = 0.002$, Supplementary Table 4). The same analysis using occupation level as

SES indicator identified the differences mentioned above between period 1 and 2 in both genders, but also an increase in relative inequalities in men in period 4

(interaction=2.6 [1.1;6.2], p=0.02, Supplementary Table 4).” (Page 13, Line 35)

Discussion: “Though hazardous consumption decreased in both genders, inequalities in alcohol consumption remained stable among men, with relative inequalities in men potentially increasing during the latter period of the study when compared to earlier ones.” (Page 15, Line 13)

17) Discussion: In the first paragraph of this section, which summarizes findings, I think it would be necessary to clarify that in women, there was a picture of no significant inequalities combined with inverse gradients -and then mention specifically what those were.

Thank you for your comment. When taking into account all the women in the study (and not divided by legislative period) we did observe significant inequalities based on educational attainment and not on occupational-level. This differed from what was observed in men and has now been included in the discussion.

“Differently from men for whom the inequalities in hazardous consumption were observed using both SES indicators, in women the inequalities were only related to educational attainment.” (Page 14, Line 14)

18) One point that needs more discussion, I believe, has to do with the limitations of this kind of analysis to really assess or evaluate the impact of policy measures.

Thank you for your comment. We do acknowledge that a longitudinal design would be desirable to follow up on the impact on alcohol consumption at the individual level. As suggested by reviewer 2, we added a warning concerning the potential delayed effects of legislation and that they might vary according to other factors not taken into account in this study (e.g. general and mental health status).

“Also, the implemented laws could have had a differential effect on population subgroups defined by factors other than SES indicators. The mental and general health status of the participants was also not taken into account and confounding by these variables cannot be excluded. The effects of each legislative package could have been delayed in time and appeared on subsequent periods or even beyond the time frame of this study.” (Page 17, Line 3)

19) An interesting finding that could be further discussed by the authors is the difference observed between men and women: what could be the potential explanations and policy implications of the different patterns observed?

Thank you for this interesting comment. There is no conclusive study on why we, and others, observe inverse inequality gradients for men and women. The same seems to be true for tobacco smoking, and we suggest that they may share the same mechanism. Like tobacco, it is possible that alcohol consumption became associated with increased SES status and emancipation among women, thus contributing to the inverse gradient.

We have included this in the discussion section.

“This gender discrepancy in inequalities suggests that different mechanisms, other than those related to SES, are behind hazardous alcohol consumption in each of the genders. While the reasons behind this discrepancy are still elusive, it is possible that like tobacco smoking,[28] among women, alcohol consumption started to be seen as a symbol of increased socioeconomic status and emancipation.[29-20] Like the tobacco industry, the alcohol industry seems to be exploiting this fact.[31] As such, policies to address inequalities in alcohol consumption should be gender-adapted and informed by further studies on their nature.” (Page 14, Line 27)

20) Please clarify that the inequalities in alcohol consumption mentioned in the conclusion statement refer to men, and a very different picture was found among women.

Thank you. This has now been clarified as follows.

“In the male adult population of Geneva, SES inequalities in hazardous alcohol consumption were identified, favouring the better off. An inverse, but less pronounced SES gradient was observed in women. The successive anti-alcohol legislation implemented in the last 20 years was unable to reduce the SES inequalities in men.” (Page 17, Line 32)

Reviewer: 2

1) I suggest to specify the year of study, because now this link shows another scales

Thank you for pointing this out. The guidelines changed in 2018 and the website has been updated. We now clearly mention that these were the values in the guidelines in 2017 and added the correct link to the guidelines at that time. We have also added a reference to a paper on Swiss alcohol consumption using the same definitions. The text now reads:

“Hazardous alcohol consumption was defined according to the Swiss Institute for Alcohol and Drug Prevention guidelines in 2017 (<http://www.iard.org/wpcontent/uploads/2016/02/Drinking-Guidelines-General-Population.pdf>) and like previous studies on Swiss alcohol consumption.[19]” (Page 7, Line 28)

2) Is it a really time-series analysis or is more an analysis controlling by the effect of the period?

We report the coefficients of the calendar year adjusted for potential confounders. We sought to determine if any linear relationships could be observed between the outcome and a time variable. So we would argue that it does constitute a time series. We can clarify further if the editors and reviewer find it necessary.

3) I suggest to include in the discussion as a limitation the fact that the law implemented in the different periods could have different target groups (maybe, a cohort effect could be considered too) and not necessarily equity targets (except taxes that have been specified in the introduction), because the authors are assuming that the law should impacted according the SES.

We have now included this in the limitations section and connected it to the lack of information concerning the general and mental health of participants.

“Also, the implemented laws could have had a differential effect on population subgroups defined by factors other than SES indicators.” (Page 17, Line 3)

4) At the same time, the different law implemented in each period could have an effect into the next period, in terms of consumption, for example (even though the limitation of the cross-sectional study is discussed by the authors -and it assumes that is not the same people interviewed, changing eventually the group of abstainers-).

The limitations now include a comment on this.

“The effects of each legislative package could have been delayed in time and appeared on subsequent periods or even behind the time frame of this study.” (Page 17, Line 10)

5) Another factors do not explored could be health status and mental health.

This has now been added to the limitations.

“The mental and general health status of the participants was also not taken into account and confounding by these variables cannot be excluded.” (Page 17, Line 8)

VERSION 2 – REVIEW

REVIEWER	Carol C. Guarnizo-Herreno University College London, UK Universidad Nacional de Colombia, Colombia
REVIEW RETURNED	03-Apr-2019

GENERAL COMMENTS	The authors have addressed all of my comments in a very satisfactory manner. I have no further concerns and think the manuscript is ready for publication.
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